

Parameters	Before RT	After RT
10-TSS (seconds)	27.9 ± 6.4	21.9 ± 4.1 [*]
SS-60 (repetitions)	26.0 ± 6.7	28.9 ± 5.7 [*]
Muscle mass - men (kg)	48.0 ± 9.1	51.5 ± 10 [*]
Muscle mass - women (kg)	34.1 ± 4.4	36.9 ± 4.9 [*]
Body fat - men (%)	29.2 ± 5.1	25.3 ± 5.1 [*]
Body fat - women (%)	34.6 ± 5.1	32.4 ± 4.7 [*]
LG- Proximal -R (cm)	53.6 ± 6.6	55.4 ± 6.7 [*]
LG- Proximal -L (cm)	52.7 ± 5.8	54.1 ± 6.7 [*]
LG- Medial -R (cm)	46.8 ± 5.1	48.6 ± 4.9 [*]
LG- Medial -L (cm)	46.6 ± 4.4	48.5 ± 5.4 [*]

LG- Leg circumference; R-right; L- left;

^{*}p < 0.01.

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IMPROVING EFFICIENCY OF DIETETIC SERVICES IN CHRONIC KIDNEY DISEASE WITH A CATEGORISED REFERRAL TOOL

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Over the past 3 years the number of CKD patients attending our renal outpatient service has increased dramatically from under 100 to over 400 patients. In this time dietetic resources within this service have remained unchanged. This has presented challenges for meeting current practice guidelines and has created long waiting lists to see the dietitian.

The aim of this project was to determine the current status of dietetic appointments and reasons for referral. Using this information we proposed to develop a new referral tool and booking procedures to enable clear prioritization of patients and appropriate referral pathways.

A nurses' perceptions questionnaire and a 4-week audit of appointments were conducted. The new referral tool and booking procedures included categorisation of clinical dietetic priority, utilisation of other community dietetic services where appropriate, and explanatory notes of which patients should take priority in fully booked clinics.

At baseline, it was found that 18 of 57 (31.6%) attempts to book dietetic appointments were not successful due to fully booked clinics (7 new and 11 reviews). While 6 of the 11 reviews were for reasons of higher dietetic urgency e.g. hyperkalaemia and malnutrition, 6 out of 7 new referrals were for lifestyle related reasons e.g. obesity, diabetes, and cholesterol. It is felt the new categorised referral tool and pathways will provide better guidance for referral and appropriate use of dietetic resources for CKD management, to be evaluated in early 2012.

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THE ROLE OF SALIVARY GLANDS IN PHOSPHATE HOMEOSTASIS

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Hyperphosphatemia is recognized as a contributor to vascular calcification in patients with chronic kidney disease (CKD) and hemodialysis (HD) patients and is independently associated with cardiac mortality. Dietary inorganic phosphorus (Pi) restriction, and the Pi binders are important therapy for dialysis patients with hyperphosphatemia. Recent study reported that salivary secretion of Pi to be an important determinant of hyperphosphatemia in patients with CKD and in those with ESRD under chronic dialysis. In the present study, we investigated the role of type IIb sodium-dependent Pi transporter (Npt2b) on salivary Pi excretion in mice.

The expression of Npt2b protein was detected at the apical side of duct cells in the salivary glands, suggesting that ductal cells appears to be able

to reabsorb Pi, thereby modifying the Pi concentration in the final saliva. In wild-type mice (Wt mice) fed a high Pi diet, the levels of plasma and salivary Pi are significantly higher than those in mice fed a low Pi diet.

In Npt2b^{+/-} mice, the salivary Pi concentrations were significantly increased compared with those in Npt2b^{+/+} mice. Npt2b^{+/-} mice with adenine-induced renal failure had low plasma and salivary Pi levels, and plasma creatinine and BUN levels compared with Npt2b^{+/+} mice treated with adenine. In conclusion, Npt2b is involved in Pi secretion by salivary glands.

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A MODIFIED MEAL REPLACEMENT PLAN AS WEIGHT LOSS TREATMENT IN CHRONIC KIDNEY DISEASE: A CASE STUDY

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Low calorie liquid meal replacements can be used to achieve weight loss in obese patients. Many consider renal disease a contraindication to this due to a lack of specific research. The aim of this case study is to illustrate that this therapy can be used effectively in Chronic Kidney Disease (CKD).

After numerous failed weight loss attempts, the multidisciplinary team (Nephrology, Endocrinology, General Practice and Dietetics) decided to trial a 65 year old patient (CKD Stage 3 secondary to Type 2 Diabetes Mellitus requiring insulin) on a modified meal replacement plan. This plan consisted of 3 Optifast meal replacement drinks plus one portion controlled meal, (4MJ and 85g of protein per day). Monitoring included frequent blood glucose self testing, fortnightly blood tests and review by the Dietitian (monthly once stable). The patient was initially unable to exercise due to pain.

At baseline, weight was 157 kg (BMI: 41 kg/m²), waist circumference 155cm and blood biochemistry indicated CKD stage 3b (eGFR: 39 ml/min, Urea: 15.9 mmol/L, Creat: 156 umol/L). After 14 weeks weight had decreased 22 kg (BMI: 35.8 kg/m²), waist circumference had decreased 18 cm and reported pain improved. Insulin requirements approximately halved, and blood biochemistry (eGFR: 42 ml/min, Urea: 15.2 mmol/L, Creat: 147 umol/L) indicated no decline in renal function. With close monitoring a modified meal replacement plan was used successfully in a patient with CKD however prospective randomised trials are required to further investigate this treatment.

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INFLUENCE OF INTENSIVE EXERCISE ON RENAL FUNCTIONS (RF) AND ADVANCED GLYCATION END-PRODUCTS (AGES)

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Under certain pathologic conditions AGEs formation can be increased beyond normal levels. The purpose of the study was to investigate essential RF and AGEs before, immediately after and 2 days after runs. Nine trained runners (43 ± 9yr) during 9.5 km and 13 trained runners (48 ± 11yr) during 16.3 km long-distance runs were investigated. Standard blood and urinary RF parameters were investigated in all runners using spectrophotometric methods by Roche analyzer Integra 800. Serum cystatin C was determined using immuno-turbidimetric method (PETIA Gentian). Plasma AGEs and malon-dialdehyde (MDA) were determined by spectrofluorimetric methods, N^ε-carboxylmethyllysine using ELISA method and advanced oxidation protein products (AOPPs) using spectrophotometric method.

Total proteinuria was 0.46 ± 0.4 g/L after 9.5 km run and 0.35 ± 0.3 g/L after 16.3 km run. Serum urea and creatinine significantly increased after both runs (creatinine in 28% after 9.5 km and in 41% after 16.3 km run). Estimated glomerular filtration rate (eGFR) MDRD and eGFR-PETIA significantly decreased after both runs (9.5 km: in 27.6% resp. 21.3% and 16.3 km: in 34.6% resp. 30.3%, p < 0.01). Direct relationship between serum cystatin C and plasma AGEs after 16.3 km run was found (r = 0.66, p = 0.014). No significant changes in plasma AGEs (from 277 ± 86—286 ± 72 resp. from 283 ± 64—292 ± 90 AU), CML (from 619 ± 78—665 ± 131 resp. from 724 ± 92—762 ± 135 ng/mL) and AOPPs (from 151 ± 58—106 ± 21 resp. from 159 ± 100—133 ± 67 μmol/L) were found after both runs. Plasma MDA decreased after both runs.

In conclusion, RF abnormalities in runners were caused by dehydration, protein catabolism, rhabdomyolysis and others. These RF changes were not present or parameters not significantly differed from initial values 2 days after both runs. Plasma AGEs and AOPPs in runners were in reference ranges, no significant changes during the both runs were observed.

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172 A POPULATION PHARMACOKINETIC (PK)- PHARMACODYNAMIC (PD) ANALYSIS OF PEGINESATIDE INDIA LYSIS PATIENTS WITH CHRONIC KIDNEY DISEASE

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Peginesatide is an erythropoiesis stimulating agent (ESA) being developed for the treatment of anemia due to chronic kidney disease in dialysis patients. The purpose of this analysis was to develop a population PK-PD model to characterize time-course of peginesatide plasma and hemoglobin (Hb) concentrations following administration of IV and SC peginesatide injections. This population PK-PD analysis included 4 phase 2 studies and 1 phase 3 study. Baseline subject demographics, laboratory values, and concomitant medications were evaluated as covariates in a stepwise manner. Models were evaluated for goodness-of-fit using diagnostic plots, predictability based on visual predictive check, and stability based on bootstrap analyses. The final PK model was a two compartment model with first-order absorption and saturable elimination. The final PD model was a precursor-dependent indirect response model with parameters accounting for the residual effect from the previous ESA doses (ESAD) and apparent change in disease condition (CF). The PD parameters shown below were estimated with good precision (relative standard error[RSE] $\leq 2\%$).

Parameters	Estimate	RSE%
EC50 (ng/mL)	401	2.0
E _{max}	0.542	1.6
Baseline Hb (g/dL)	11.5	0.40
MTT (mean transit time for red blood cells, h)	1640	0.49
MTP (mean transit time for progenitor cells, h)	462	1.1
ESA (residual effect from the previous ESA)	0.153	0.66
CF (correction factor for disease condition)	0.000275	0.87

Total bilirubin, body mass index, age, alkaline phosphatase, ethnicity, and serum creatinine (for non-dialysis subjects) for PK and age and ESAD for PD were identified as statistically significant (p-value < 0.005) covariates. None of these identified covariates were considered to be clinically relevant, based on their impact on simulated peginesatide exposure ($< \pm 30\%$) and Hb (< 0.2 g/dL) levels.

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173 PUTATIVE ROLE OF FGF 23 IN THE DEVELOPMENT OF HYPOPHOSPHATEMIA AND BONE FRACTURES IN AN ANEMIC PATIENT TREATED BY INTRAVENOUS SACCHARATED FERRIC OXIDE

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A post-menopausal patient with normal kidney function was referred to our hospital because of severe lumbar pain. She had been treated by initially oral, and then by intravenous iron for longer than five years for the treatment of iron deficiency anemia due to recurrent GI bleeding. On admission, multiple lumbar bone fracture with low bone mineral density was confirmed. Laboratory tests revealed severe hypophosphatemia (1.6 mg/dL) with slight decrease of calcium ion level. Serum levels of 25D and 1,25D were low normal, while increase of intact PTH (83.9 pg/mL) and FGF23 (60 pg/mL) were observed. After terminating intravenous iron supplement, her symptoms and hypophosphatemia were gradually normalized with oral active vitamin D treatment. Although we could not completely exclude the contribution of disturbed iron absorption from the intestine, damages of proximal tubular cells by iron, and osteomalacia caused by the deposition of iron, increased FGF23 level may have played critical roles in the development of severe hypophosphatemia in this patient. Such hypophosphatemia due to high FGF23 has recently been reported in patients treated by intravenous saccharated ferric oxide.

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174 THE EATING AT TREATMENT (EAT) QUESTIONNAIRE: A TOOL TO ASSESS HABITS RELATED TO PATIENTS EATING AT DIALYSIS

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Within the US, the policies at dialysis facilities differ as to whether patients (pts) are permitted to eat or not while being treated. The Eating At Treatment (EAT) pilot program was designed to determine whether educating pts and allowing them to eat on dialysis would reduce the number of missed meals on dialysis days and potentially improve nutritional status. The EAT questionnaire was developed as a tool to assess eating habits of pts on days they received dialysis treatment vs non-treatment days. Seven Registered Dietitians (RDs) administered the EAT questionnaire to 61 pts.

Patients reported eating a different number of meals/day (2.32 vs 2.69) and snacks/day (1.09 vs 1.36) on treatment vs non-treatment days, respectively. Of the pts who ate at the dialysis facility, 86% reported that they ate during treatment as opposed to before or after treatment. Of the pts who did not eat at the dialysis facility, the most common reported reasons were that they were not hungry (63%) or reported an adverse event (eg., stomach pain, risk of diarrhea, hypotension) (20%). Reported dietary intake from 37 pts who ate during dialysis was scored by RDs for protein and kcal content. Adequate intake was set at > 200 kcal for calorie intake and > 10 g of protein for protein intake. Nineteen (51%) pts reported adequate kcal intake, while only 12 (32%) pts reported adequate protein intake.

Based on results obtained from this small pilot questionnaire, pts reported eating less on treatment days vs non-treatment days. In addition, pts reported that their intake at treatment was low in protein. This questionnaire has proven to be an effective tool that is easy to administer and score (total time ~ 12 min/pt) for providing insight into the eating habits of pts receiving dialysis treatment. An opportunity exists for educating pts through nutritional counseling about increasing their protein and kcal intake on treatment days. Distribution of this questionnaire to a large number of dialysis pts may prove useful for reevaluating policies regarding eating at dialysis centers.

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175 PRACTICES AND OPINIONS ON IN-CENTER FOOD CONSUMPTION ACROSS 1,223 FACILITIES IN THE UNITED STATES

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In the United States, the practices and opinions of healthcare providers regarding eating on dialysis are unknown. The purpose of this study was to understand healthcare provider opinions and in-center hemodialysis patient practices regarding eating while at the dialysis center. In June 2011, over 1200 registered dietitians within a large dialysis organization in the US were surveyed on current practices and opinions of patient food consumption during dialysis treatment using an online survey.

1223 of 1665 (73%) dialysis facilities responded to the food consumption survey.

n=1222	Permitted n (%)	No Guidelines n (%)	Not allowed n (%)
Eating on dialysis	803 (66%)	67 (5%)	352 (29%)
Drinking on dialysis	907 (75%)	87 (7%)	228 (19%)

218 (18%) of the respondents stated that the facility practice for consuming nutritional supplements (eg., liquid nutritional supplements and/or protein bars) while on dialysis was different than the policy for consuming food while on dialysis. Interestingly, 1203 (98%) of the respondents stated consuming food before or after dialysis was allowed.

The top reasons for facility practices that allowed eating during dialysis were: prevention of hypoglycemia on dialysis, improved kcal intake on dialysis days, and the opportunity to provide counseling on food products currently chosen by the patient. The top reasons for facility practices not permitting eating during dialysis included: potential adverse events associated with hypotension, GI symptoms, choking, infection, pest control, and spills. Further analyses are warranted to determine whether there is a correlation between allowing patients to eat during dialysis treatment and an improvement in the nutritional status of the patients.

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